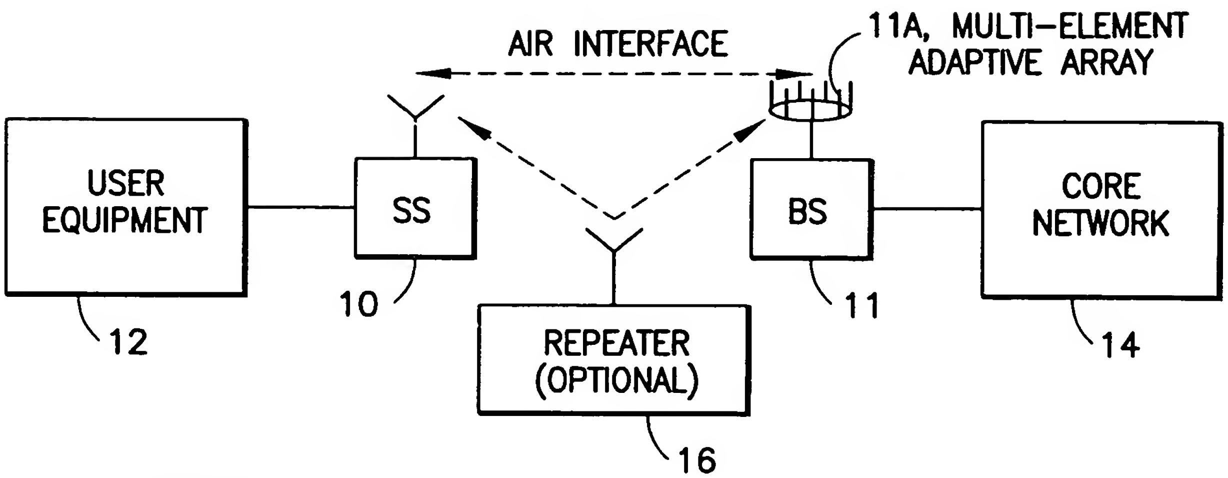


FIG.1 WIRELESS ACCESS REFERENCE MODEL

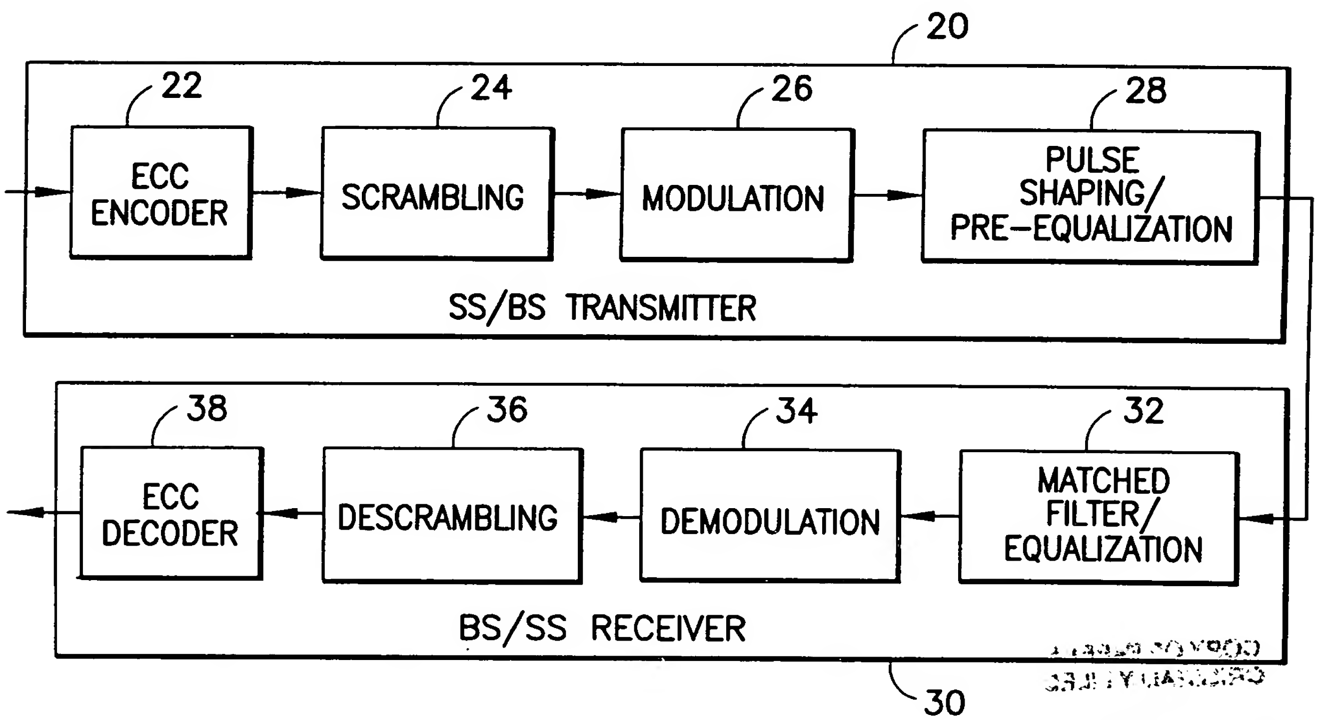


FIG.2 PHY REFERENCE MODEL SHOWING DATA FLOW

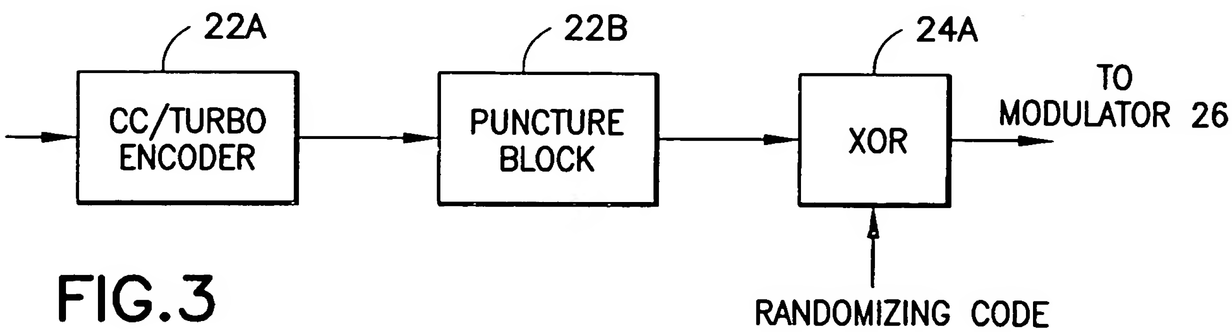


FIG.3

	MODULATION AND CHANNEL CODING		
PARAMETER	QPSK w/R=4/5 CODING (1.6 BITS/SYM)	16-QAM w/R=4/5 CODING (3.2 BITS/SYM)	64-QAM w/R=4/5 CODING (4.8 BITS/SYM)
RF CHANNEL BANDWIDTH	3.5 MHz	3.5 MHz	3.5 MHz
CHIP RATE	2.56 Mcps	2.56 Mcps	2.56 Mcps
COMMUNICATION CHANNEL BANDWIDTH	4.096 Mbps	8.192 Mbps	12.288 Mbps
PEAK DATA RATE	4.096 Mbps	8.192 Mbps	12.288 Mbps
CDMA CHANNEL BANDWIDTH (SF=1)	4.096 Mbps	8.192 Mbps	12.288 Mbps
CDMA CHANNEL BANDWIDTH (SF=16)	256 kbps	512 kbps	768 kbps
CDMA CHANNEL BANDWIDTH (SF=128)	32 kbps	64 kbps	96 kbps
MODULATION FACTOR	1.17 bps/Hz	2.34 bps/Hz	3.511 bps/Hz

FIG.4 HYPOTHETICAL PARAMETERS FOR A 3.5 MHz RF CHANNELIZATION

	QPSK		16 QAM		64 QAM	
NUMBER OF ELEMENTS	AGGREGATE CAPACITY (Mbps)	MODULATION FACTOR	AGGREGATE CAPACITY (Mbps)	MODULATION FACTOR	AGGREGATE CAPACITY (Mbps)	MODULATION FACTOR
1	4.096	1.17	8.192	2.34	12.288	3.511
2	8.192	2.34	16.384	4.68	24.576	7.022
4	16.384	4.68	32.768	9.36	49.152	14.044
8	32.768	9.36	65.536	18.72	98.304	28.088
16	65.536	18.72	131.072	37.44	196.608	56.176

FIG.5 AGGREGATE CAPACITY AND MODULATION FACTORS VERSUS MODULATION TYPE AND ARRAY SIZE

$$x_n(t)=\sum_{\ell=1}^{L_n}\alpha_{n,\ell}\, a(\Theta_{n,\ell})s_n(t-\tau_{n,\ell})$$

FIG.6A

$$v_n=\sum_{\ell=1}^{L_{op}}\alpha_{n,\ell}\, a(\Theta_{n,\ell})\exp(-j\omega_c\tau_{n,\ell})$$

FIG.6B

$$y_n(t)=[w^*_{n,1}\quad w^*_{n,2}\quad \Lambda\quad w^*_{n,M}]\begin{bmatrix}x_1(t)\\ x_2(t)\\ M\\ x_M(t)\end{bmatrix}=w_n^H x(t)$$

FIG.6C

$$R_{ii}(n)=\sum_{i=1,i_{i}\neq n}^{N}\sigma_s^2 v_i\, v_i^H+\sigma_n^2 I_M$$

FIG.6D

$$SINR_{opt}=\sigma_s^2 v_n^H R_{ii}^{-1}(n)v_n$$

FIG.6E

$$SINR_{opt}(2)=\frac{\sigma_s^2}{\sigma_n^2}\left[\|v_1\|^2-\frac{\sigma_s^2|v_1^H v_2|^2}{\sigma_n^2+\sigma_s^2\|v_2\|^2}\right]$$

FIG.6F

$$SINR_{opt}(2)=\frac{\sigma_s^2}{\sigma_n^2}\left[M-\frac{\sigma_s^2|v_1^H v_2|^2}{\sigma_n^2+M\sigma_s^2}\right]\approx M\frac{\sigma_s^2}{\sigma_n^2}\left[1-\frac{|v_1^H v_2|^2}{M^2}\right]$$

FIG.6G

$$\xi_n(c)=\sum_{i\varepsilon Sc}|v_n^H v_i|^2\quad \sum_{i\varepsilon Sc}\rho_{n,i}$$

FIG.6H

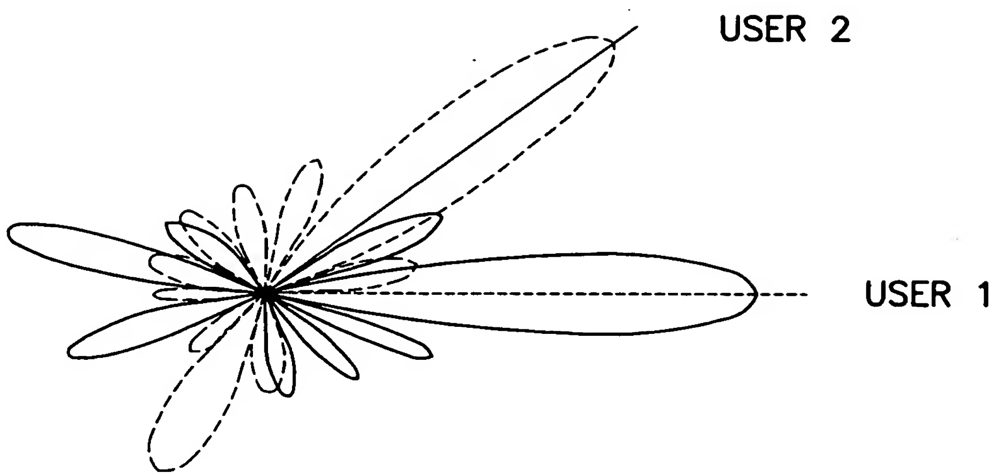


FIG.7

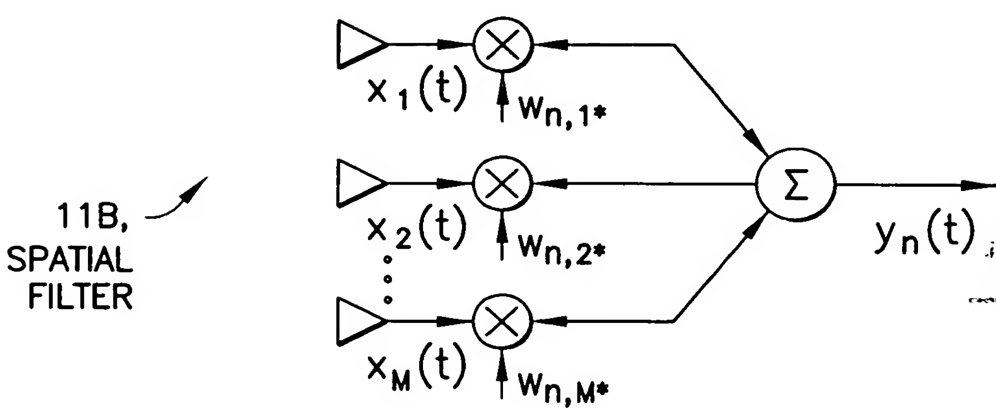


FIG.8

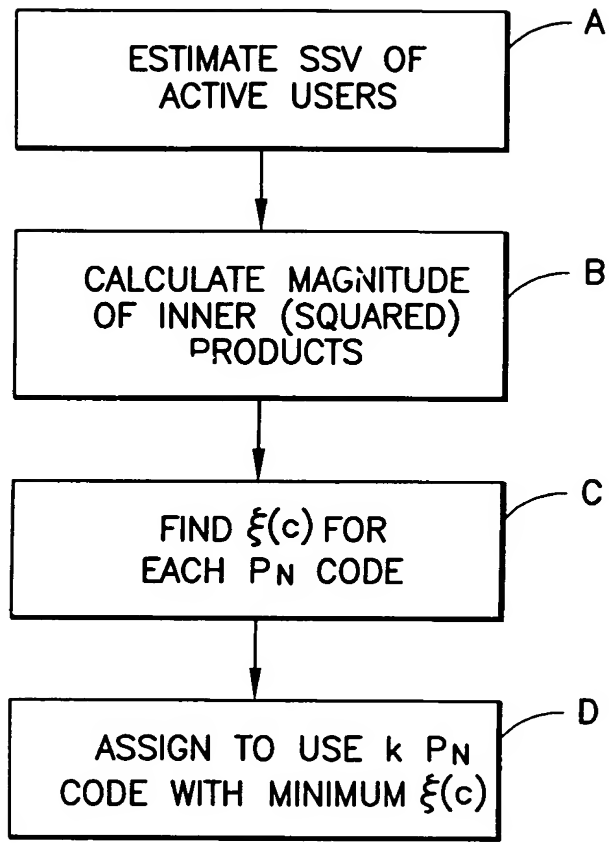

ESTIMATE SSV OF ACTIVE USERS
A
CALCULATE MAGNITUDE OF INNER (SQUARED) PRODUCTS
B
FIND $\xi(c)$ FOR EACH P_N CODE
C
ASSIGN TO USE k P_N CODE WITH MINIMUM $\xi(c)$
D

FIG.9

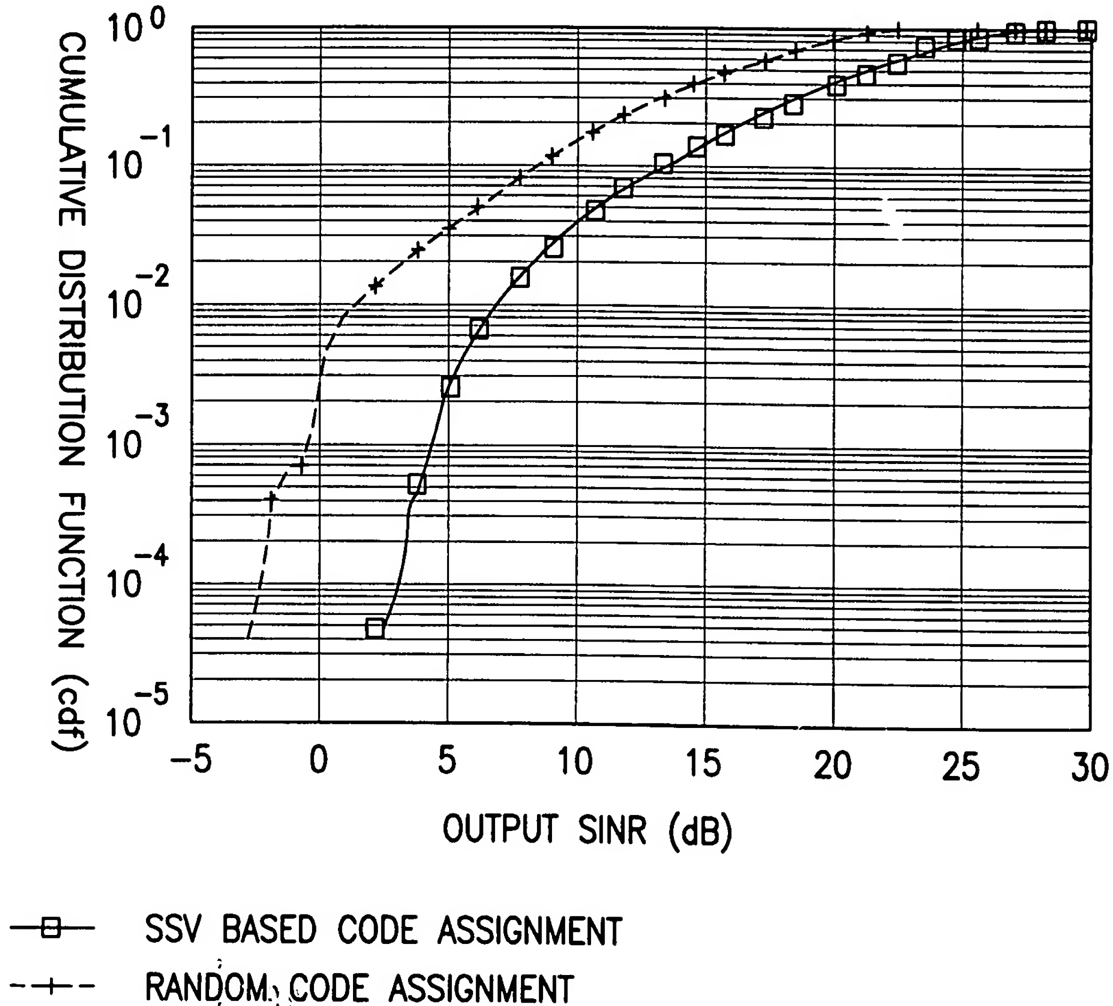

CUMULATIVE DISTRIBUTION FUNCTION (cdf)
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
–5
0
5
10
15
20
25
30
OUTPUT SINR (dB)
SSV BASED CODE ASSIGNMENT
RANDOM CODE ASSIGNMENT

FIG.10

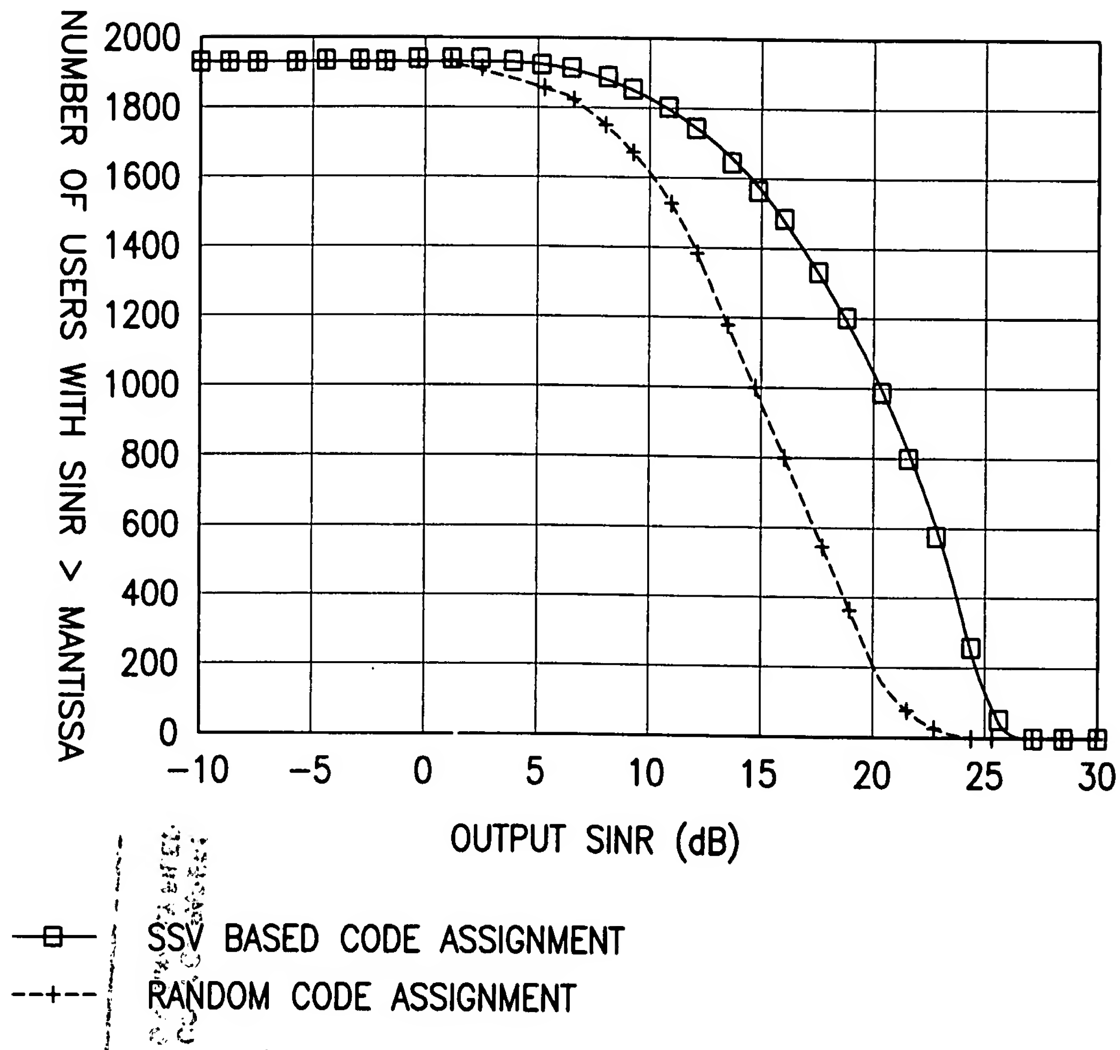
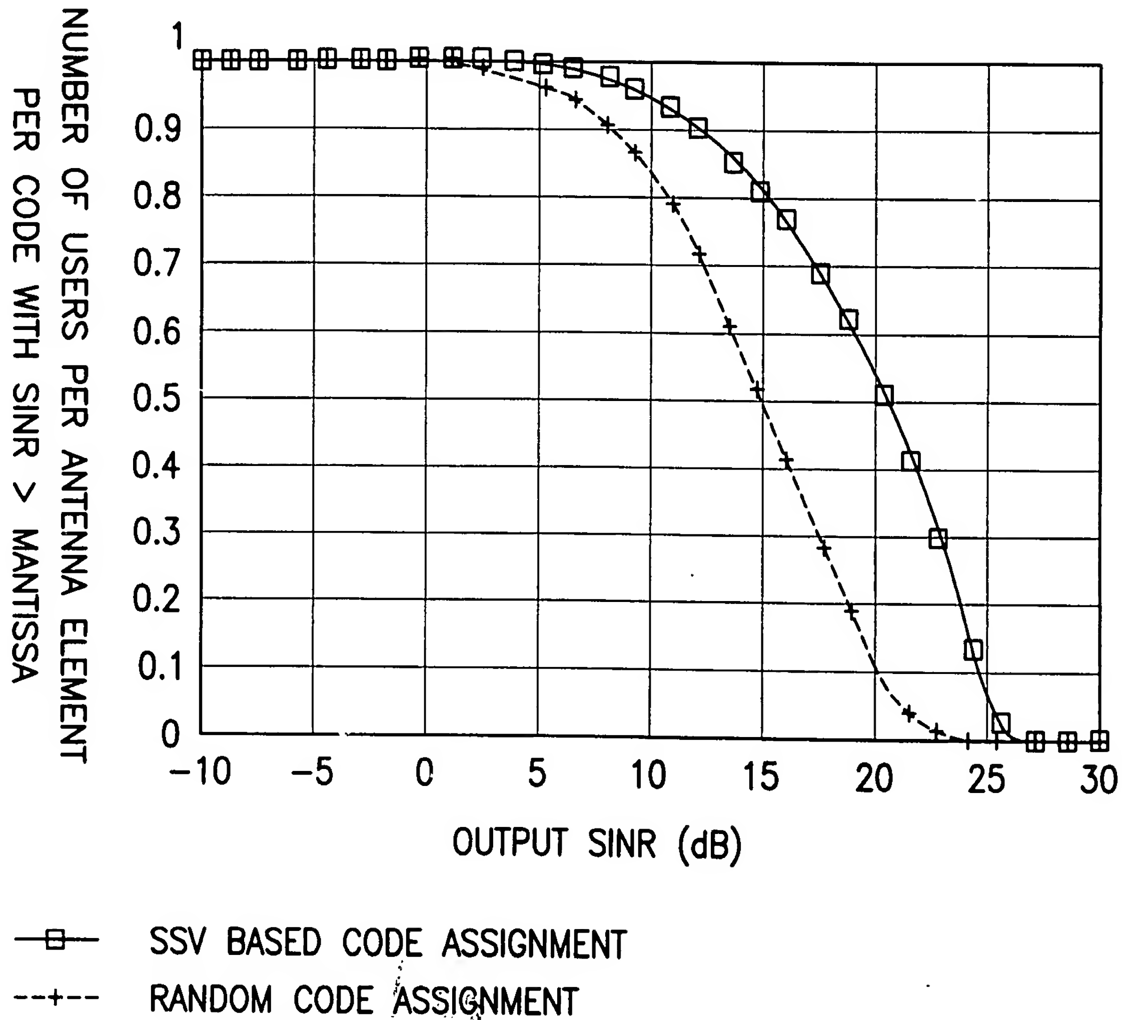

NUMBER OF USERS WITH SINR > MANTISSA
2000
1800
1600
1400
1200
1000
800
600
400
200
0
−10
−5
0
5
10
15
20
25
30
OUTPUT SINR (dB)
SSV BASED CODE ASSIGNMENT
RANDOM CODE ASSIGNMENT

FIG.11



NUMBER OF USERS PER ANTENNA ELEMENT PER CODE WITH SINR > MANTISSA
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
−10
−5
0
5
10
15
20
25
30
OUTPUT SINR (dB)
SSV BASED CODE ASSIGNMENT
RANDOM CODE ASSIGNMENT

FIG.12